



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/695,727	10/28/2003	Craig M. Carpenter	MI22-2433	5546
21567	7590	11/21/2005	EXAMINER	
WELLS ST. JOHN P.S. 601 W. FIRST AVENUE, SUITE 1300 SPOKANE, WA 99201			MOORE, KARLA A	
			ART UNIT	PAPER NUMBER
			1763	
DATE MAILED: 11/21/2005				

Please find below and/or attached an Office communication concerning this application or proceeding.

h

<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/695,727	CARPENTER ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Karla Moore	1763	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 August 2005.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 76-88,90-103,105,106 and 108-126 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 76-88,92,95-103 and 110-120 is/are allowed.
- 6) ☒ Claim(s) 121-126 is/are rejected.
- 7) ☒ Claim(s) 90,91,93,94,105,106,108 and 109 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Objections*

1. Claims 90-91, 93-94, 105-106 and 108-109 are objected to because of the following informalities:  
Each of the claims is dependent on a cancelled claim. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims **121-124** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,089,543 to Freerks in view of U.S. Patent No. 5,223,113 to Kaneko et al., U.S. Patent No. 5,484,483 to Kyogoku, U.S. Patent No. 6,045,620 to Tepman et al. and U.S. Patent No. 4,289,061 to Emmett.
4. Freerks discloses a semiconductor substrate processing chamber and accessory attachment interfacial structure substantially as claimed and comprising: a body (Figures 3 and 6, 28, 30, 32, 34) sized and shaped to engage between a semiconductor substrate processing chamber (Figure 1, 14) and an accessory attachment (Figure 1, 12) which is exposed to the processing chamber, the body having first and second faces; the body comprising an external perimeter extending between the first and second faces; and the body comprising a volume in at least one cross section region which extends to diametrically opposing portions of the perimeter.
5. However, Freerks et al. fail to teach the body comprising a volume in at least one cross section region, at least a majority of said cross sectional region constituting a mass of substantially non-metallic and thermally insulative material, the mass being sufficient to effectively reduce heat transfer between the semiconductor processing chamber and the accessory attachment when so engaged than would otherwise occur in the absence of said mass of material when so engaged.

Art Unit: 1763

6. Kaneko et al. teach the use of ceramic material at a peripheral portion of a contacting interface between two chambers for purpose of providing excellent heat insulation, which enables power consumption of the heater (in a processing chamber) to be made smaller and the temperature control of the process chamber to be made easier (column 2, rows 45-48; column 5, rows 44-46; column 7, rows 38-44; and column 8, rows 6-14). Kaneko teaches the use of a clearance (Figure 5, C1) the ceramic, insulating material for the purpose of preventing contact between two metallic surfaces, thus allowing heat to be transferred only through convection (column 7, rows 45-54). The mass of material of Kaneko et al. comprises openings extending through the mass of material for fixedly attaching the mass of material (column 5, rows 44-51).

7. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided non-metallic, thermally insulating material peripheral to a metallic passageway in Freerks in order to provide excellent heat insulation, enabling power consumption of the heater (in a processing chamber) to be made smaller and the temperature control of the process chamber to be made easier as taught by Kaneko et al. It would have been further obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a clearance created by ceramic, insulating material in Freerks in order to prevent any heat transfer other than by convection as taught by Kaneko et al.

8. Freerks and Kaneko et al. disclose the invention substantially as claimed and as described above.

9. However, Freerks and Kaneko et al. fail to teach the accessory attachment as something other than a transfer chamber that attaches with a housing of a processing chamber and communicates with the chamber.

10. Kyogoku teach the use of an accessory attachment interfacial structure (Figure 3, 8; column 3, row 55 through column 4, row 3) between a processing chamber and a vent line for the purpose of insulating before and after the vent for the purposes of preventing heat from escaping and improving the average thermal characteristic of a heating unit.

Art Unit: 1763

11. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an accessory interfacial structure in an apparatus such as the one described in Freerks and Kaneko et al. for insulating between a processing chamber and a vent in order to prevent heat from escaping and to improve the average thermal characteristic of a heating unit as taught by Kyogoku.

12. Freerks, Kaneko et al. and Kyogoku disclose the invention substantially as claimed and as described above.

13. However, Freerks, Kaneko et al. and Kyogoku fail to teach the interfacial structure comprising a plurality of openings for receiving load bearing plugs.

14. Tepman et al. teach the use of a plurality of openings and supplying a plurality of screws (or other appropriate means) to those openings in order to attach the interfacial structure to a transfer chamber (column 4, row 65 through column 5, row 1 and column 5, rows 35-36).

15. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a plurality of openings and to have supplied a plurality of screws to those openings in Freerks, Kaneko et al. and Kyogoku in order to attach an interfacial structure to a transfer chamber as taught by Tepman et al.

16. Freerks, Kaneko et al., Kyogoku and Tepman disclose the invention substantially as claimed and as described above.

17. However, Freerks, Kaneko et al., Kyogoku and Tepman fail to teach the body comprising load bearing plugs within at least some of the openings in the thermally insulative material, the load bearing plugs having greater compression strength than the thermally insulative material and at least some of the load bearing plugs comprising holes extending therethrough which are sized to received mounting bolts.

18. Emmett teaches the use load bearing plugs (Figure 1, 2) including a hollow portion sized to receive mounting bolts (20) where the purpose of the hollow portion is to absorb a substantial amount of

Art Unit: 1763

the total load applied by the plug (column 2, rows 41-49). The load bearing plugs have outer longitudinal surfaces which are not threaded (column 1, rows 53-64).

19. It would have been obvious to one of ordinary skill in art at the time the Applicant's invention was made to have provided at least some of load bearing plugs with a hollow portion in Freerks, Kaneko et al. and Tepman in order to absorb a substantial amount of the total load applied by the plug as taught by Emmett.

20. With respect to claims 122 and 124, as noted above, Emmett teaches the use of load bearing plugs including a hollow portion.

21. Claims **125 and 126** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,089,543 to Freerks in view of U.S. Patent No. 5,223,113 to Kaneko et al., U.S. Patent No. 5,484,483 to Kyogoku, U.S. Patent No. 6,045,620 to Tepman et al., U.S. Patent No. 4,289,061 to Emmett and U.S. Patent No. 1,686,468 to Rosenberg.

22. Freerks discloses a semiconductor substrate processing chamber and accessory attachment interfacial structure substantially as claimed and comprising: a body (Figures 3 and 6, 28, 30, 32, 34) sized and shaped to engage between a semiconductor substrate processing chamber (Figure 1, 14) and an accessory attachment (Figure 1, 12) which is exposed to the processing chamber, the body having first and second faces; the body comprising an external perimeter extending between the first and second faces; and the body comprising a volume in at least one cross section region which extends to diametrically opposing portions of the perimeter.

23. However, Freerks et al. fail to teach the body comprising a volume in at least one cross section region, at least a majority of said cross sectional region constituting a mass of substantially non-metallic and thermally insulative material, the mass being sufficient to effectively reduce heat transfer between the semiconductor processing chamber and the accessory attachment when so engaged than would otherwise occur in the absence of said mass of material when so engaged.

24. Kaneko et al. teach the use of ceramic material at a peripheral portion of a contacting interface between two chambers for purpose of providing excellent heat insulation, which enables power

Art Unit: 1763

consumption of the heater (in a processing chamber) to be made smaller and the temperature control of the process chamber to be made easier (column 2, rows 45-48; column 5, rows 44-46; column 7, rows 38-44; and column 8, rows 6-14). Kaneko teaches the use of a clearance (Figure 5, C1) the ceramic, insulating material for the purpose of preventing contact between two metallic surfaces, thus allowing heat to be transferred only through convection (column 7, rows 45-54). The mass of material of Kaneko et al. comprises openings extending through the mass of material for fixedly attaching the mass of material (column 5, rows 44-51).

25. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided non-metallic, thermally insulating material peripheral to a metallic passageway in Freerks in order to provide excellent heat insulation, enabling power consumption of the heater (in a processing chamber) to be made smaller and the temperature control of the process chamber to be made easier as taught by Kaneko et al. It would have been further obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a clearance created by ceramic, insulating material in Freerks in order to prevent any heat transfer other than by convection as taught by Kaneko et al.

26. Freerks and Kaneko et al. disclose the invention substantially as claimed and as described above.

27. However, Freerks and Kaneko et al. fail to teach the accessory attachment as something other than a transfer chamber that attaches with a housing of a processing chamber and communicates with the chamber.

28. Kyogoku teach the use of an accessory attachment interfacial structure (Figure 3, 8; column 3, row 55 through column 4, row 3) between a processing chamber and a vent line for the purpose of insulating before and after the vent for the purposes of preventing heat from escaping and improving the average thermal characteristic of a heating unit.

29. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided an accessory interfacial structure in an apparatus such as the one described in Freerks and Kaneko et al. for insulating between a processing chamber and a vent in order to prevent

Art Unit: 1763

heat from escaping and to improve the average thermal characteristic of a heating unit as taught by Kyogoku.

30. Freerks, Kaneko et al. and Kyogoku disclose the invention substantially as claimed and as described above.

31. However, Freerks, Kaneko et al. and Kyogoku fail to teach the interfacial structure comprising a plurality of openings for receiving load bearing plugs.

32. Tepman et al. teach the use of a plurality of openings and supplying a plurality of screws (or other appropriate means) to those openings in order to attach the interfacial structure to a transfer chamber (column 4, row 65 through column 5, row 1 and column 5, rows 35-36).

33. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a plurality of openings and to have supplied a plurality of screws to those openings in Freerks, Kaneko et al. and Kyogoku in order to attach an interfacial structure to a transfer chamber as taught by Tepman et al.

34. Freerks, Kaneko et al., Kyogoku and Tepman disclose the invention substantially as claimed and as described above.

35. However, Freerks, Kaneko et al., Kyogoku and Tepman fail to teach the body comprising load bearing plugs within at least some of the openings in the thermally insulative material, the load bearing plugs having greater compression strength than the thermally insulative material and at least some of the load bearing plugs comprising holes extending therethrough which are sized to received mounting bolts.

36. Emmett teaches the use load bearing plugs (Figure 1, 2) including a hollow portion sized to receive mounting bolts (20) where the purpose of the hollow portion is to absorb a substantial amount of the total load applied by the plug (column 2, rows 41-49). The load bearing plugs have outer longitudinal surfaces which are not threaded (column 1, rows 53-64).

37. It would have been obvious to one of ordinary skill in art at the time the Applicant's invention was made to have provided at least some of load bearing plugs with a hollow portion in Freerks, Kaneko et al.



Art Unit: 1763

and Tepman in order to absorb a substantial amount of the total load applied by the plug as taught by Emmett.

38. Freerks, Kaneko et al., Kyogoku, Tepman and Emmett disclose the invention substantially as claimed and as described above.

39. However, Freerks, Kaneko et al., Kyogoku, Tepman and Emmett fail to teach at least some of the load bearing plugs having at least one radial projection, the body comprising interlocking openings sized to receive said radial projections effective to preclude rotation of said load bearing plugs having the radial projection.

40. Rosenberg teaches the use of load bearing plugs comprising radial projections interlocking with openings sized to receive said radial projections in a device for fastening two parts together for the purpose of providing a fastener capable of affording a great amount of frictional resistance to any stress tending to withdraw the fastener (page 1, column 2, rows 73-99). The interlocking openings are created upon insertion of the load bearing plug.

41. It would have been obvious to one of ordinary skill in the art at the time the Applicant's invention was made to have provided a fastener with radial projections and corresponding interlocking openings in Freerks, Kaneko et al., Kyogoku, Tepman and Emmett in order to provide a fastener capable of affording a great amount of frictional resistance to any stress tending to withdraw the fastener as taught by Rosenberg.

42. With respect to claim 126, as noted above, Emmett teaches the use of load bearing plugs including a hollow portion.

***Allowable Subject Matter***

43. The following is a statement of reasons for the indication of allowable subject matter: Claims 76-88, 92, 95-103 and 110-120 are allowed.

Art Unit: 1763

44. Claims 90-91, 93-94 and 105-106 and 108-109 would be allowable if rewritten to overcome the claim objections provided above. It appears that each of the claims at issue was meant to depend from an already allowable claim.

45. The following is an examiner's statement of reasons for allowance: The prior art of record fails to teach or fairly suggest a semiconductor substrate processing chamber and accessory attachment interfacial structure as recited, wherein load bearing plugs are received in openings of the body and extending through the thermally insulative material, wherein at least some of the load bearing plugs are entirely solid and at least some include a hollow portion. Further, no piece of properly combinable prior art was located that provided motivation for providing this feature in the prior art.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

#### ***Response to Arguments***

46. Applicant's arguments, filed 22 August 2005, with respect to claims 76-88,92,95-103 and 110-120 have been fully considered and are persuasive. The rejections of these claims have been withdrawn. Claims 90-91, 93-94 and 105-106 and 108-109 are objected to for reasons detailed above. New claims 121-126 are rejected above, over previously relied upon art as well as newly cited art, Rosenberg, which discloses providing ribbed load bearing plugs as claimed.

#### ***Conclusion***

47. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH

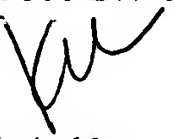
Art Unit: 1763

shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karla Moore whose telephone number is 571.272.1440. The examiner can normally be reached on Monday-Friday, 8:30am-5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Parviz Hassanzadeh can be reached on 571.272.1435. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Karla Moore  
Patent Examiner  
Art Unit 1763  
11 November 2005